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EXAMINER

KOCH, GEORGE R

ART UNIT

PAPER NUMBER

1734

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/941,476

Applicant(s)

WHITMAN, JOHN

Examiner

George R. Koch III

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1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22, 24, 26, 27, 29, 31, 58 and 59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22, 24, 26, 27, 29, 31, 58 and 59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6-12-2003 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 22, 24, 26, 27, 29, 31, 58 and 59 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

a. In claim 22, the new matter consists of the limitations of "a logic control unit executing a process to coat a wafer, wherein the process comprises: dispensing the solvent from the third nozzle to prewet the front surface of the wafer; actuating the rotatable wafer-holding mechanism to spin the wafer until the solvent is distributed across the front surface of the wafer; upon distributing the

solvent, dispensing the photo resist solution on the wafer; actuating the rotatable wafer-holding mechanism until the photo resist solution is distributed; and upon distributing the photo resist material, dispensing the solvent from the first nozzle to remove an edge bead and dispensing the solvent from the second nozzle to clean the back surface of the wafer.” The specification and claims as originally filed merely state that the “solenoids are in turn connected to track coating unit logic” (see specification page 9, lines 9-19). Furthermore, no recitation of the logic control unit executing the process step of actuating the rotatable wafer-holding mechanism to spin the wafer.

b. In claim 24, 26, 27, 29 and 31, the new matter consists of the limitations of “a logic control unit executing a process to coat a wafer, wherein the process comprises: distributing the solvent on the wafer using the third nozzle and rotating the wafer-holding mechanism; upon distributing the solvent, distributing the photo resist solution on the wafer using the first and second nozzles; and upon distributing the photo resist material, dispensing the solvent from the first nozzle.” The specification and claims as originally filed merely state that the “solenoids are in turn connected to track coating unit logic” (see specification page 9, lines 9-19). Furthermore, no recitation of the logic control unit executing the process step of rotating the wafer holding mechanism.

Furthermore, with respect to claim 26, there is no disclosure in the application as originally filed of the logic control unit executing a process wherein the step of “distributing the solvent on the wafer using the third nozzle comprises:

dispensing the solvent at the center on the wafer top surface: and actuating the rotatable wafer holding mechanism to spin the wafer until the solvent is distributed across the wafer surface”.

Furthermore, with respect to claim 27, there is no disclosure in the application as originally filed of the logic control unit executing a process wherein the step of “distributing the photo resist solution on the wafer surface comprises: dispensing the photo resist solution on the wafer; and actuating the rotatable wafer holding mechanism to spin the wafer until the photo resist solution is distributed across the wafer surface”.

c. In claims 58 and 59, the new matter consists of the limitations of “a logic control unit to execute a process to coat a wafer, wherein the process comprises: dispensing the bulk solvent on a wafer surface using the third nozzle; spinning the wafer on the rotatable base until the bulk solvent is distributed across the wafer surface; dispensing photo resist solution on the wafer; spinning the wafer until the photo resist solution is distributed across the wafer surface; and dispensing the bulk solvent on the edge and sides of the wafer using the first nozzle and on the back of the wafer using the second nozzle for edge bead removal and cleanup after distributing the photo resist.” The specification and claims as originally filed merely state that the “solenoids are in turn connected to track coating unit logic” (see specification page 9, lines 9-19). Furthermore, no recitation of the logic control unit executing either the process step of spinning the wafer until the bulk solvent is distributed across the wafer surface or the

process step of spinning the wafer until the photo resist solution is distributed across the wafer surface.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
6. Claim 22, 24, 26, 27, 29, 31, 58 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (Figure 1, and page 9, lines 9-19) and further in view of the Orth, Gordon and Yoda.

The admitted prior art discloses a solvent dispense in fluid communication with a source of a photoresist solution and in fluid communication with a solvent source, wherein the solvent head includes a first nozzle directed at the side of the wafer, and a second nozzle directed at the back surface of the wafer. The admitted prior art also discloses a logic control unit to execute a process to coat a wafer. The admitted prior art discloses spinning the wafer.

The admitted prior art does not disclose a third nozzle directed at a center of the front surface of the wafer, or that the solvent includes diacetone alcohol and aliphatic ester. The admitted prior art does not disclose a wafer spinning structure.

Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, and a rotatable wafer-holding mechanism, and a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth discloses two nozzles equivalent to the claimed third nozzle, one for photoresist the other for solvent which are aimed toward the center. Both nozzles are capable of dispensing towards the center of the top surface of the wafer, due to the nozzle movement capabilities. It is notoriously well known and conventional, and also logical through an understanding of physics, that during spin coating the dispensing of material to the center of a spinning wafer allows for the fastest spreading of coating material over the entire surface. This is due to the fact that spin step allows spreading away from the center, but not to the center, due to centrifugal forces. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have included an additional pair of nozzles equivalent to the claimed third nozzle aimed at the center of the wafer and a wafer spinning mechanism for faster coating of the wafer.

The modified apparatus of the admitted prior art and Orth is considered capable of executing the claimed process of the logic control unit.

The admitted prior art is also silent to the source of solvent containing a solvent that includes diacetone alcohol and aliphatic ester.

Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not expressly teach or suggest diacetone alcohol and

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aliphatic ester. One in the art would appreciate diacetone alcohol and aliphatic ester are well known and conventional solvents used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol and aliphatic ester as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34, 36, 39). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol and aliphatic ester to the dispense head of the admitted prior art as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol and aliphatic ester to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Claim 24, 26 and 27 are rejected under similar grounds as claim 22, and the apparatus of the admitted prior art, Orth, Gordon and Yoda is considered capable of executing the claimed steps.

As to claim 29, the apparatus of claim 24 is capable of dispensing the claimed. In any event, the admitted prior art teaches that conventional photoresist itself is a three component material consisting of resin, a photoactive compound, and a solvent (specification page 1, lines 20-24), but does not teach that the same solvent is used. Gordon further teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). One in the art would immediately appreciate that using the same solvent would reduce the possibility of unnecessary chemical reactions and simplify material supplies. Therefore, it would have been obvious to one of ordinary skill in the art to have used the

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same solvent as suggested by Gordon in order to reduce unnecessary reactions and simplify material supplies.

As to claim 31, the admitted prior art dispenses solvent through the first nozzle and the second nozzle in order to remove edge beads and to clean the back of the wafer (see Figure 1 of the instant application).

As to claim 58, see the rejection of claim 22 above. The admitted prior art, in addition to disclosing the solvent dispense head and the first and second nozzles and a logic control unit as applied above, further discloses the additional elements of the bulk solvent and a track coating unit coupled to the bulk solvent container, the track coating unit comprising the previously cited elements of a solvent dispense head and a logic control unit (see page 9 of the specification as originally filed, lines 9-25). Orth as applied above in claim 22 (see rejection of claim 22 above for the discussion of obviousness and the motivational statements) provides the missing elements of the third nozzle and the rotatable base. The apparatus of the admitted prior art, Orth, Gordon and Yoda is considered capable of executing the claimed steps.

Furthermore, as to claim 58, the admitted prior art discloses that the track coating unit further comprises solenoids coupled to the logic control unit for controlling the flow through the nozzles (see page 9 of the specification as originally filed, lines 9-25)

Response to Arguments

7. Applicant's arguments with respect to claims 22, 24, 26, 27, 29, 31, 58 and 59 have been considered but are moot in view of the new ground(s) of rejection. However, the issues raised in the remarks will be discussed below.

8. In response to applicant's argument that there is no suggestion to combine the references (i.e., improper to combine the references) the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Orth discloses the additional elements of centrally disposed nozzles, and the motivation for incorporation of centrally located nozzles in a spin coating environment is apparent from the references since it offers improved coating times and coverages relative to the not using a centrally located nozzle.

9. In response to applicant's argument that the references do not disclose the process steps that the apparatus performs, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

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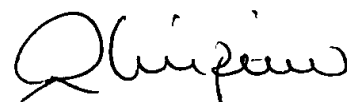
Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (703) 305-3435 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-800-877-8339 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (703) 308-3853. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



George R. Koch III
August 11, 2003



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